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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,480	07/06/2007	Jin-Woo Cheon	54577-10900	5996
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HOLME ROBERTS & OWEN LLP 1700 LINCOLN STREET, SUITE 4100 DENVER, CO 80203				
EXAMINER				
ZIMMER, ANTHONY J				
ART UNIT		PAPER NUMBER		
1793				
NOTIFICATION DATE		DELIVERY MODE		
08/12/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO\_Mail@hro.com

### Office Action Summary

**Application No.**

10/598,480

**Applicant(s)**

CHEON ET AL.

**Examiner**

ANTHONY J. ZIMMER

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12, 14, 15 and 18-35 is/are pending in the application.
- 4a) Of the above claim(s) 4-12, 14, 15, 20-23, 32 and 35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 18-19, 24-31, and 33-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1-2, 18-19, 24-31, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by the journal article by Sun et al.**

In regard to claims 1,18-19, 26-27, 30-31, and 33 Sun teaches adding a iron precursor to a surfactant mixture of oleic acid ( $n=17$ ) and oleylamine ( $n=18$ ) in a phenyl ether solvent (boiling point  $258^{\circ}\text{C}$ ) and heated at reflux (i.e. the boiling point of the solvent) for 30 minutes to form  $\text{Fe}_3\text{O}_4$  magnetic, metal oxide nanoparticles followed by separation (at least by deposition on a substrate and drying for x-ray diffraction). See Scheme 1 and the first full paragraph in the right-hand column on page 8204 and the caption of Figure 2.

In regard to claim 2, Sun teaches  $\text{Fe}(\text{AcAc})_3$ , (an organometallic compound).

In regard to claim 24, Sun teaches 6 mmol oleic acid and 6 mm oleylamine with 2 mmol iron precursor thus the surfactant is in the solution in an amount of 6 times that of the metal precursor.

In regard to claim 25, Sun teaches 20 mL of phenyl ether solvent which is about 126 mmol (density =  $1.08 \text{ g/cc}$ ), thus the solvent is present in an amount of 63 times that of the metal precursor.

In regard to claim 28, though it is not mentioned in Sun, the metal oxide concentration controls the size of the produced nanoparticles inherently. Further, this claim does not limit the process because before a process such as that of Sun is performed, the concentrations are predetermined and thus adjusted. Whether or not the inventor adjusted the concentration while considering size is immaterial and not considered a process step that limits the instantly claimed invention.

In regard to claim 29, though it is not mentioned in Sun, the surfactant concentration (a ratio of surfactants to precursor, solvent, etc.) controls the size of the

produced nanoparticles inherently. Further, this claim does not limit the process because before a process such as that of Sun is performed, the concentrations are predetermined and thus adjusted. Whether or not the inventor adjusted the concentration while considering size is immaterial and not considered a process step that limits the instantly claimed invention.

**Claims 1-2, 18-19, 24-31, and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Sun '231.**

In regard to claims 1, 18-19, 26-27, 30-31, and 33 Sun '231 teaches adding a iron precursor to a surfactant mixture of oleic acid ( $n=17$ ) and oleylamine ( $n=18$ ) in a phenyl ether solvent (boiling point  $258^{\circ}\text{C}$ ) and heated at reflux (i.e. the boiling point of the solvent,  $200-360^{\circ}\text{C}$ ) for 30 minutes to form  $\text{Fe}_3\text{O}_4$  magnetic, metal oxide nanoparticles followed by separation. See Figure 1, [0030], and [0036].

In regard to claim 2, Sun '231 teaches  $\text{Fe}(\text{AcAc})_3$ , (an organometallic compound).

In regard to claim 24, Sun '231 teaches 6 mmol oleic acid and 6 mm oleylamine with 2 mmol iron precursor thus the surfactant is in the solution in an amount of 6 times that of the metal precursor.

In regard to claim 25, Sun '231 teaches 20 mL of phenyl ether solvent which is about 126 mmol (density = 1.08 g/cc), thus the solvent is present in an amount of 63 times that of the metal precursor.

In regard to claims 28-29, Sun teaches control of the particle size by adjustment of the stabilizer (amine/acid) to iron ratio (i.e. amount of precursor) which is considered

both a concentration of magnetic precursor and a composition ratio of surfactants. See [0007].

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 3 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun '231.**

In regard to claim 3, Sun does not specifically mention using the nitrate compounds required, however, when making composite nanoparticles Sun teaches that metal salts can be from any one of the following salts: Zn, Cu, Ni, Co, Mn. See [0026]. Thus, one of ordinary skill in the art would have found it obvious to use a common salt such as a nitrate.

In regard to claims 33-34, Sun teaches composite nanoparticles can also be made. See [0026]. Claim 34 limits the single component nanoparticles of claim 33, but single component nanoparticles are not required by claim 33.

### ***Allowable Subject Matter***

It should be noted by applicant that if the independent claim were to require iron (II) nitrate or iron (III) nitrate used as the metal oxide or magnetic oxide precursor, the claim would be allowable over the prior art because the closest prior art of record (Sun '231) does not teach or suggest using any iron nitrate and instead teaches using only iron organometallic compounds. See [0026], claim 3, and examples of Sun '231.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. ZIMMER whose telephone number is (571)270-3591. The examiner can normally be reached on Monday - Friday 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ajz

/Anthony J Zimmer/  
Examiner, Art Unit 1793

/Stanley Silverman/  
Supervisory Patent Examiner, Art Unit 1793